OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from **MEETINGHOUSE POND** the program coordinators recommend the following actions. *We would like to encourage the monitors to conduct more sampling events in the future. With a limited amount of data it is difficult to determine water quality trends. Since weather patterns and activity in the watershed can change throughout the summer it is a good idea to sample the pond several times over the course of the season.*

FIGURE INTERPRETATION

- Figure 1: These graphs illustrate concentrations of chlorophyll-a in the water column. Algae are microscopic plants that are a natural part of lake ecosystems. Algae contain chlorophyll-a, a pigment necessary for photosynthesis. A measure of chlorophyll-a can indicate the abundance of algae in a lake. The historical data (the bottom graph) show a *fairly stable* in-lake chlorophyll-a trend. The chlorophyll concentration was back to a normal range for the lake this season and was above the NH mean. Golden-brown algae were dominant in the lake this year; these are common algae throughout NH's lakes and ponds. While algae are present in all lakes, an excess amount of any type is not welcomed. Concentrations can increase when there are external and internal sources of phosphorus, which is the nutrient algae depend upon for growth. It's important to continue the education process and keep residents aware of the sources of phosphorus and how it influences lake quality.

- Figure 2: Water clarity is measured by using a Secchi disk. Clarity, or transparency, can be influenced by such things as algae, sediments from erosion, and natural colors of the water. The graphs on this page show historical and current year data. The lower graph shows a *very stable* trend in lake transparency. Water clarity seems to be uniform, and does not seem to fluctuate with the changing chlorophyll or phosphorus concentrations, or changing weather patterns. The low transparency of the pond might be due to the natural tea coloring of the water. This year's clarity was again below the state mean. The 2000 sampling season was considered to be wet and, therefore, average transparency readings are expected to be slightly lower than last year's readings. Higher amounts of rainfall usually cause more eroding of sediments into the lake and streams, thus decreasing clarity.

- Figure 3: These figures show the amounts of phosphorus in the epilimnion (the upper layer in the lake); the upper graph shows current year data. Phosphorus is the limiting nutrient for plants and algae in New Hampshire waters. Too much phosphorus in a lake can lead to increases in plant growth over time. These graphs show a *variable* trend for in-lake phosphorus levels, which means levels are not stable from year to year. The phosphorus concentration this season was the lowest the lake has ever experienced and was below the state median. The return of rain most likely helped to flush the lake out and lower the phosphorus concentrations. One of the most important approaches to reducing phosphorus levels is educating the public. Humans introduce phosphorus to lakes by several means: fertilizing lawns, septic system failures, and detergents containing phosphates are just a few. Keeping the public aware of ways to reduce the input of phosphorus to lakes means less productivity in the lake. Contact the VLAP coordinator for tips on educating your lake residents or for ideas on testing your watershed for phosphorus inputs.

OTHER COMMENTS

- In-lake conductivity has remained low since 1997 (Table 6). This is a positive sign since conductivity increases often indicate the influence of human activities on surface waters. Septic system leachate, agricultural runoff, iron deposits, and road runoff can all influence conductivity.

- Dissolved oxygen was high throughout the water column in July (Table 9). Shallow ponds tend to mix continuously through wind and wave action, thereby allowing for oxygen exchange with the atmosphere. We expect the oxygen concentration will continue to remain high in the pond.

- If this year's sampling events were hindered by lack of time please remember the Franklin Pierce College Water Quality Lab is open at the college in Rindge. This lab was established to reduce the driving time for the VLAP monitors in the southwestern region of the state. This lab will ensure the quality of the analyses, since the time spent driving to the lab is much less than the drive to Concord. We encourage the lake association to utilize this lab next summer for all sampling events (except for our annual visit, of course!). To find out more about the lab, or to pick up bottles and equipment, call Michele Hood, the lab manager, at (603) 899-4384.

NOTES

- Monitor's Note (7/21/00): A large amount of bladderwort floating on surface of pond. Water lilies covering back part of pond.

USEFUL RESOURCES

Save Our Streams Handbook for Wetlands Conservation and Sustainability. (800) BUG-IWLA, or visit www.iwla.org

Phosphorus in Lakes, WD-BB-20, NHDES Fact Sheet, (603) 271-3503 or www.state.nh.us

Clean Water in Your Watershed. Terrene Institute, 1993. (800) 726-5253, or www.terrene.org.

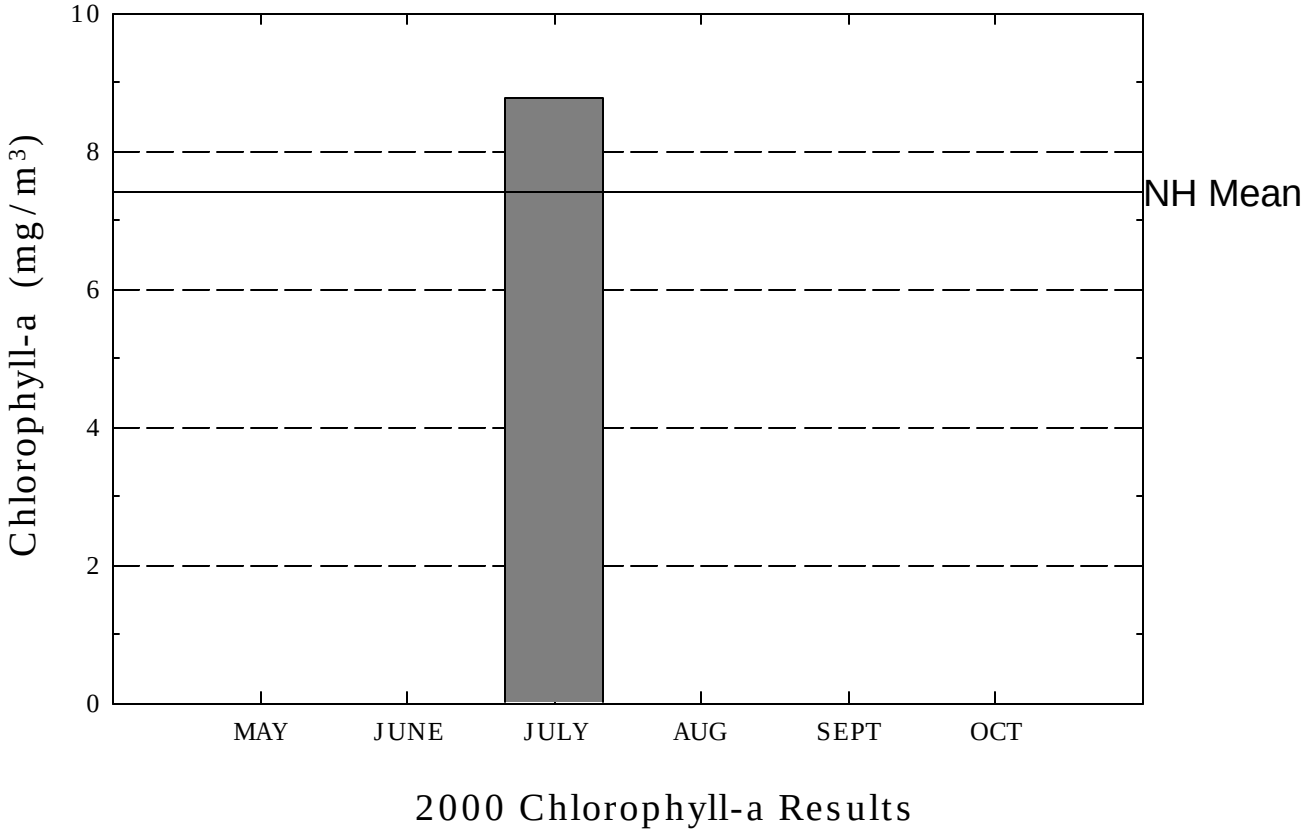
Lake Conservation Handbook. North American Lake Management Society, 1989. (608) 233-2836 or www.nalms.org

Aquatic Plants and Their Role in Lake Ecology, WD-BB-44, NHDES Fact Sheet, (603) 271-3503 or www.state.nh.us

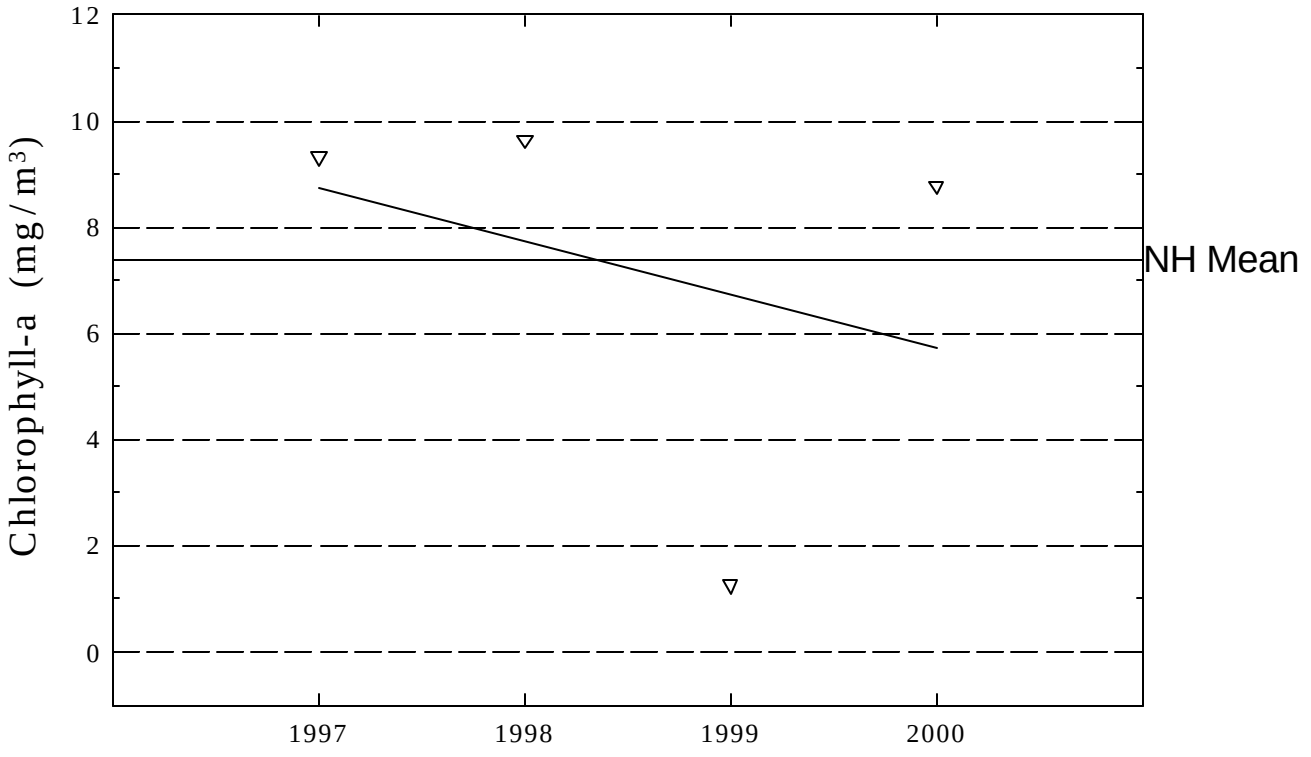
Weed Watchers: An Association to Halt the Spread of Exotic Aquatic Plants, WD-BB-4, NHDES Fact Sheet, (603) 271-3503 or www.state.nh.us

Meetinghouse Pond

Figure 1. Monthly and Historical Chlorophyll-a Results



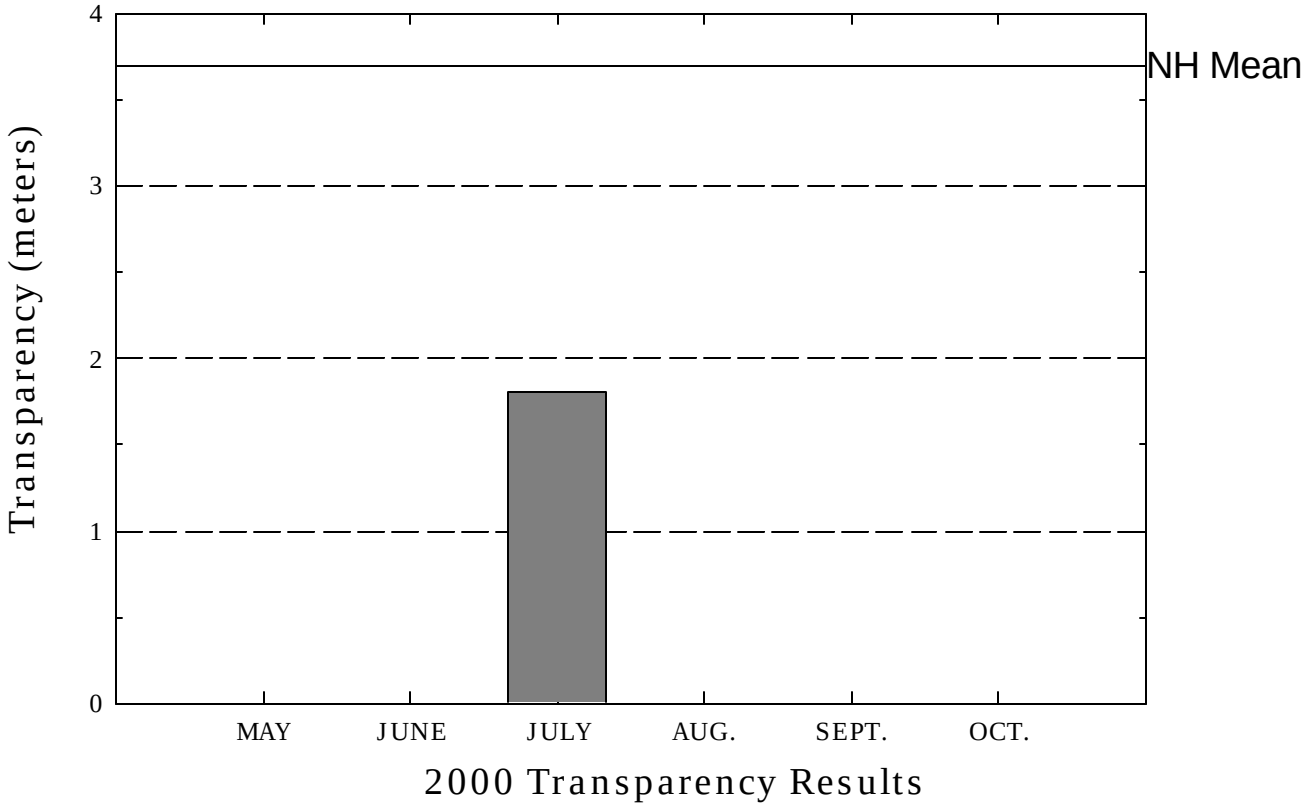
2000 Chlorophyll-a Results

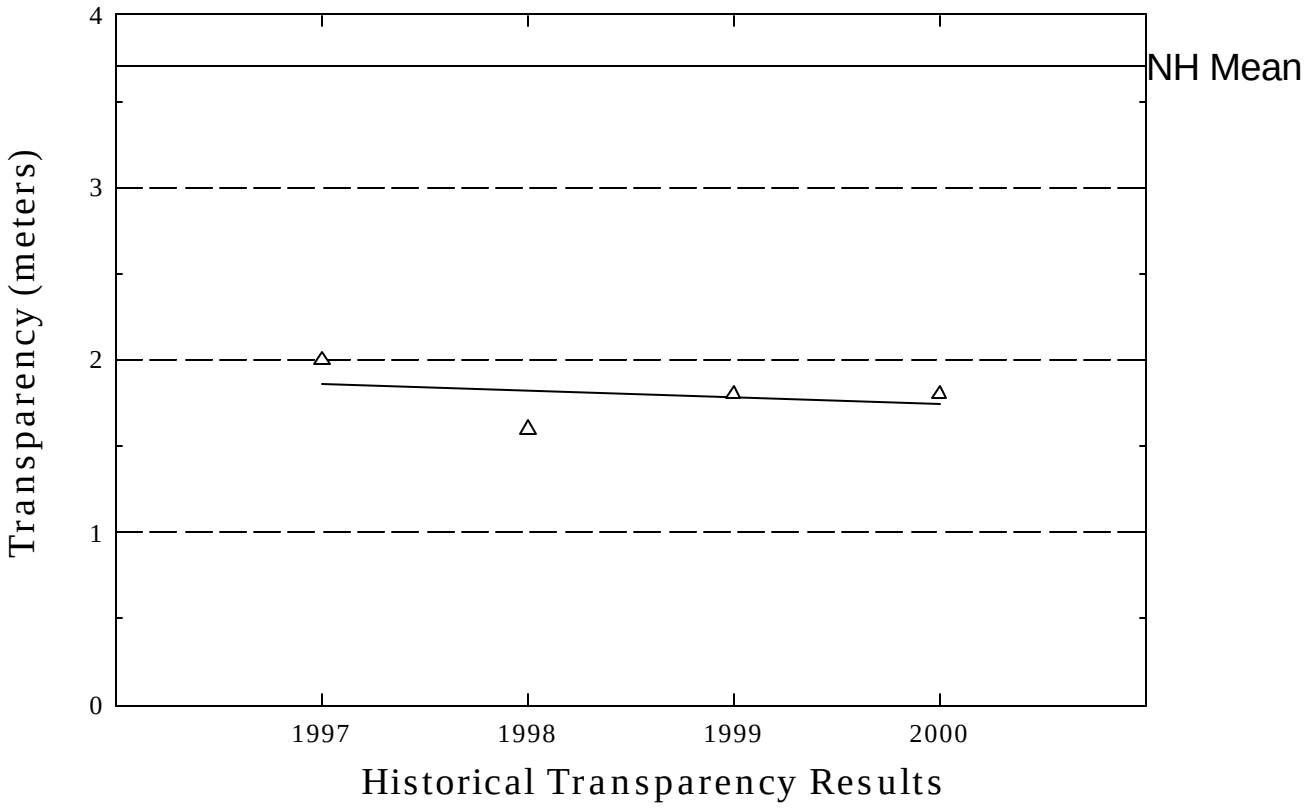


Historical Chlorophyll-a Results

Meetinghouse Pond

Figure 2. Monthly and Historical Transparency Results





Meetinghouse Pond

Figure 3. Monthly and Historical Total Phosphorus Data.

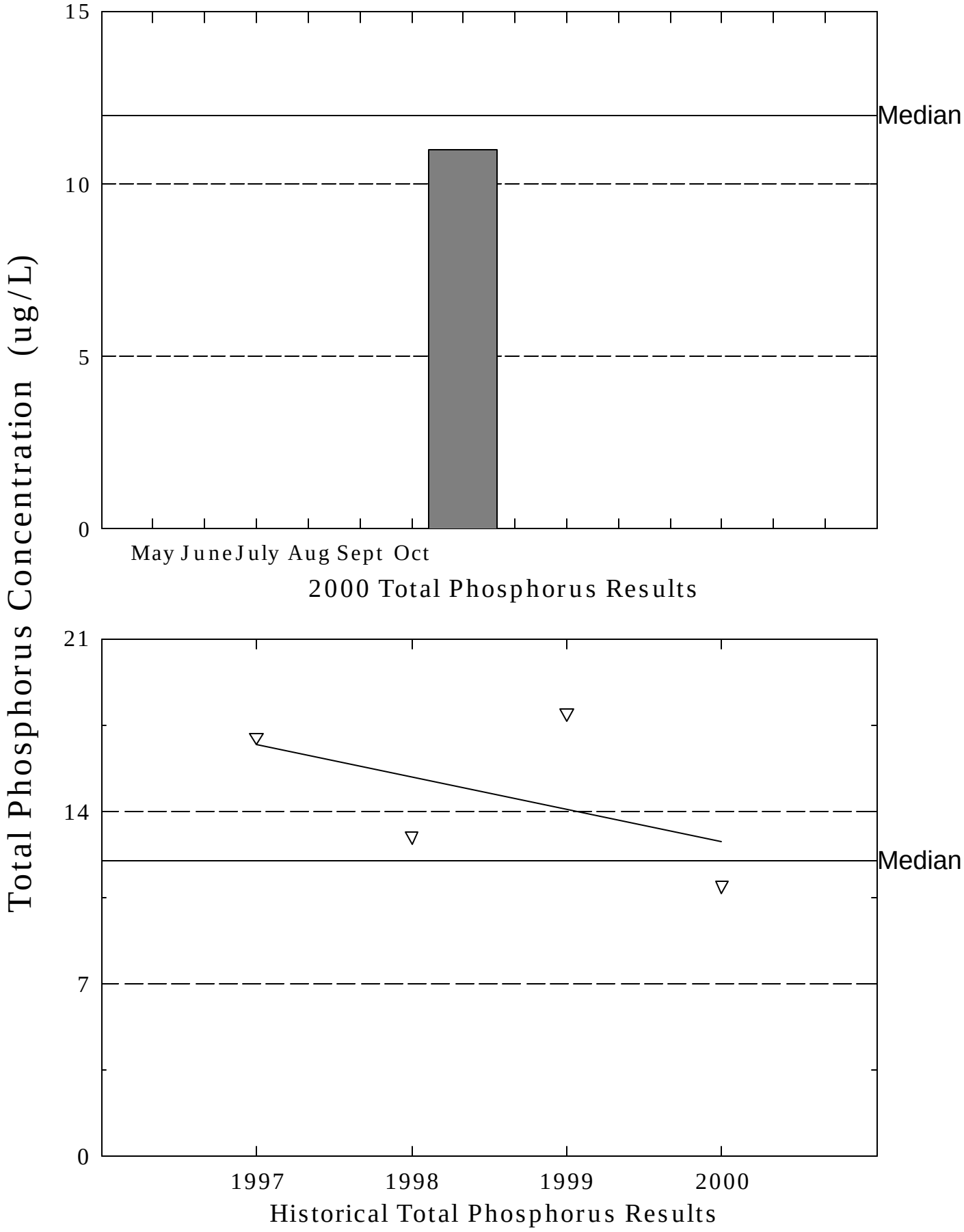


Table 1.

MEETINGHOUSE POND

MARLBORO

Chlorophyll-a results (mg/m^3) for current year and historical sampling periods.

Year	Minimum	Maximum	Mean
1997	9.33	9.33	9.33
1998	9.64	9.64	9.64
1999	1.26	1.26	1.26
2000	8.77	8.77	8.77

Table 2.

MEETINGHOUSE POND

MARLBORO

Phytoplankton species and relative percent abundance.

Summary for current and historical sampling seasons.

Date of Sample	Species Observed	Relative % Abundance
07/16/1997	ELAKATOTHRIX	51
	ASTERIONELLA	31
	MALLOMONAS	9
08/20/1998	CRYPTOMONAS	85
	SYNURA	7
	MALLOMONAS	6
07/19/1999	MALLOMONAS	12
	ASTERIONELLA	62
	DINOBRYON	10
07/21/2000	SYNURA	97
	MALLOMONAS	2
	DINOBRYON	1

Table 3.

MEETINGHOUSE POND

MARLBORO

Summary of current and historical Secchi Disk transparency results (in meters).

Year	Minimum	Maximum	Mean
1997	2.0	2.0	2.0
1998	1.6	1.6	1.6
1999	1.8	1.8	1.8
2000	1.8	1.8	1.8

Table 4.

MEETINGHOUSE POND

MARLBORO

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1997	4.88	4.88	4.88
	1998	5.08	5.08	5.08
	1999	5.07	5.07	5.07
	2000	5.16	5.16	5.16

Table 5.

MEETINGHOUSE POND

MARLBORO

Summary of current and historical Acid Neutralizing Capacity.
Values expressed in mg/L as CaCO .

Epilimnetic Values

Year	Minimum	Maximum	Mean
1997	0.00	0.00	0.00
1998	0.20	0.20	0.20
1999	0.00	0.00	0.00
2000	0.20	0.20	0.20

Table 6.

MEETINGHOUSE POND
MARLBORO

Specific conductance results from current and historic sampling seasons. Results in uMhos/cm.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1997	23.2	23.2	23.2
	1998	19.9	19.9	19.9
	1999	22.3	22.3	22.3
	2000	20.5	20.5	20.5

Table 8.

MEETINGHOUSE POND

MARLBORO

Summary historical and current sampling season Total Phosphorus data. Results in ug/L.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1997	17	17	17
	1998	13	13	13
	1999	18	18	18
	2000	11	11	11

Table 9.

MEETINGHOUSE POND

MARLBORO

Current year dissolved oxygen and temperature data.

Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
		July 21, 2000	
0.1	22.8	6.9	80.3
1.0	22.1	6.6	75.8
2.0	21.5	4.3	48.6

Table 10.

MEETINGHOUSE POND

MARLBORO

Historic Hypolimnetic dissolved oxygen and temperature data.

Date	Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
July 16, 1997	2.5	20.5	1.1	12.0
August 20, 1998	2.0	21.2	4.9	54.0
July 19, 1999	2.0	22.9	2.0	23.7
July 21, 2000	2.0	21.5	4.3	48.6

Table 11.

MEETINGHOUSE POND

MARLBORO

Summary of current year and historic turbidity sampling.

Results in NTU's.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1997	0.6	0.6	0.6
	1998	1.5	1.5	1.5
	1999	1.1	1.1	1.1
	2000	0.6	0.6	0.6